

Supplemental Material;

GSTM1, GSTT1, and GSTP1 Polymorphisms and Associations between Air Pollutants and Markers of Insulin Resistance in Elderly Koreans

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Supplemental Material, Table S1. Correlation among PM₁₀, SO₂, O₃, and NO₂ exposure levels in the health examination day. Correlation coefficient and *p*-value were presented.

	PM ₁₀ SO	²	O ₃ NO	²
PM₁₀	1	0.61 <.0001	-0.12 <.0001	0.65 <.0001
SO₂		1 <.0001	-0.30 <.0001	0.56 <.0001
O₃			1 <.0001	-0.35
NO₂				1

Supplemental Material, Table S2. Associations of PM₁₀, SO₂, O₃, and NO₂ with glucose, insulin, and HOMA indices according to lag day.

	Lag day	Glucose			Insulin			HOMA		
		Estimate	95% CI	p-Value	Estimate	95% CI	p-Value	Estimate	95% CI	p-Value
PM ₁₀	Lag 0	0.01	-0.05, 0.08	0.6706	-0.01	-0.46, 0.44	0.9586	-0.03	-0.18, 0.13	0.7404
	Lag 1	0.002	-0.07, 0.07	0.9581	0.07	-0.43, 0.57	0.7794	0.04	-0.13, 0.21	0.6560
	Lag 2	0.08	0.004, 0.15	0.0401	0.24	-0.28, 0.77	0.3631	0.14	-0.04, 0.32	0.1270
	Lag 3	0.09	0.02, 0.15	0.0087	0.26	-0.20, 0.73	0.2698	0.12	-0.04, 0.28	0.1472
	Lag 4	0.11	0.05, 0.17	0.0005	0.21	-0.22, 0.64	0.3439	0.14	-0.003, 0.29	0.0549
	Lag 5	0.05	-0.01, 0.10	0.1236	0.11	-0.30, 0.52	0.6082	0.08	-0.07, 0.22	0.2924
	Lag 6	0.06	0.01, 0.11	0.0166	0.17	-0.18, 0.52	0.3490	0.06	-0.06, 0.19	0.2982
	Lag 7	0.07	0.02, 0.12	0.0099	0.02	-0.36, 0.40	0.9264	0.03	-0.10, 0.16	0.6728
	Lag 8	0.10	0.05, 0.16	0.0002	0.06	-0.34, 0.46	0.7758	0.07	-0.07, 0.20	0.3447
	Lag 9	0.02	-0.03, 0.07	0.4418	-0.15	-0.52, 0.22	0.4352	-0.03	-0.16, 0.10	0.6596
	Lag 10	0.05	-0.01, 0.11	0.0866	0.22	-0.20, 0.63	0.3057	0.08	-0.06, 0.22	0.2594
SO ₂	Lag 0	-0.05	-0.11, 0.01	0.1314	0.04	-0.40, 0.47	0.8752	-0.03	-0.18, 0.12	0.6829
	Lag 1	-0.04	-0.10, 0.02	0.1825	0.13	-0.30, 0.56	0.5457	0.04	-0.11, 0.18	0.6223
	Lag 2	0.02	-0.04, 0.08	0.5099	0.09	-0.34, 0.53	0.6707	0.08	-0.07, 0.23	0.2801
	Lag 3	0.07	0.01, 0.13	0.0259	0.34	-0.10, 0.78	0.1342	0.15	-0.003, 0.30	0.0552
	Lag 4	0.06	-0.003, 0.12	0.0647	0.30	-0.13, 0.73	0.1689	0.15	0.001, 0.29	0.0490
	Lag 5	-0.002	-0.06, 0.06	0.9614	0.005	-0.42, 0.43	0.9825	0.02	-0.12, 0.17	0.7764
	Lag 6	0.02	-0.04, 0.08	0.4556	0.19	-0.23, 0.60	0.3714	0.06	-0.08, 0.20	0.4029
	Lag 7	0.10	0.03, 0.16	0.0026	0.30	-0.14, 0.74	0.1825	0.13	-0.02, 0.28	0.0907
	Lag 8	0.08	0.02, 0.15	0.0148	0.17	-0.30, 0.64	0.4800	0.09	-0.07, 0.25	0.2860
	Lag 9	0.06	-0.02, 0.13	0.1338	0.29	-0.21, 0.79	0.2540	0.10	-0.07, 0.27	0.2391
	Lag 10	0.04	-0.04, 0.11	0.3469	0.38	-0.14, 0.91	0.1505	0.11	-0.07, 0.29	0.2364
O ₃	Lag 0	0.11	-0.01, 0.22	0.0756	-0.05	-0.87, 0.78	0.9138	-0.01	-0.30, 0.27	0.9235
	Lag 1	0.19	0.09, 0.29	0.0002	0.42	-0.31, 1.14	0.2592	0.22	-0.03, 0.47	0.0858
	Lag 2	0.08	-0.02, 0.18	0.1009	0.42	-0.27, 1.12	0.2297	0.17	-0.07, 0.40	0.1677
	Lag 3	0.09	-0.004, 0.19	0.0607	0.36	-0.35, 1.06	0.3196	0.12	-0.12, 0.36	0.3367
	Lag 4	0.11	0.02, 0.21	0.0211	0.78	0.10, 1.46	0.0252	0.25	0.02, 0.48	0.0375
	Lag 5	0.19	0.09, 0.28	0.0001	0.70	0.02, 1.39	0.0439	0.30	0.06, 0.53	0.0139
	Lag 6	0.10	-0.002, 0.20	0.0549	-0.02	-0.76, 0.72	0.9612	-0.02	-0.27, 0.24	0.8948
	Lag 7	0.01	-0.10, 0.11	0.9026	-0.57	-1.31, 0.18	0.1353	-0.22	-0.47, 0.04	0.0966
	Lag 8	0.09	-0.01, 0.19	0.0838	0.30	-0.41, 1.01	0.4102	0.09	-0.15, 0.34	0.4500
	Lag 9	0.07	-0.02, 0.16	0.1480	0.35	-0.31, 1.02	0.2994	0.16	-0.07, 0.39	0.1699
	Lag 10	0.03	-0.06, 0.13	0.5055	0.51	-0.20, 1.22	0.1583	0.15	-0.09, 0.39	0.2224

Supplemental Material, Table S2. (Continued)

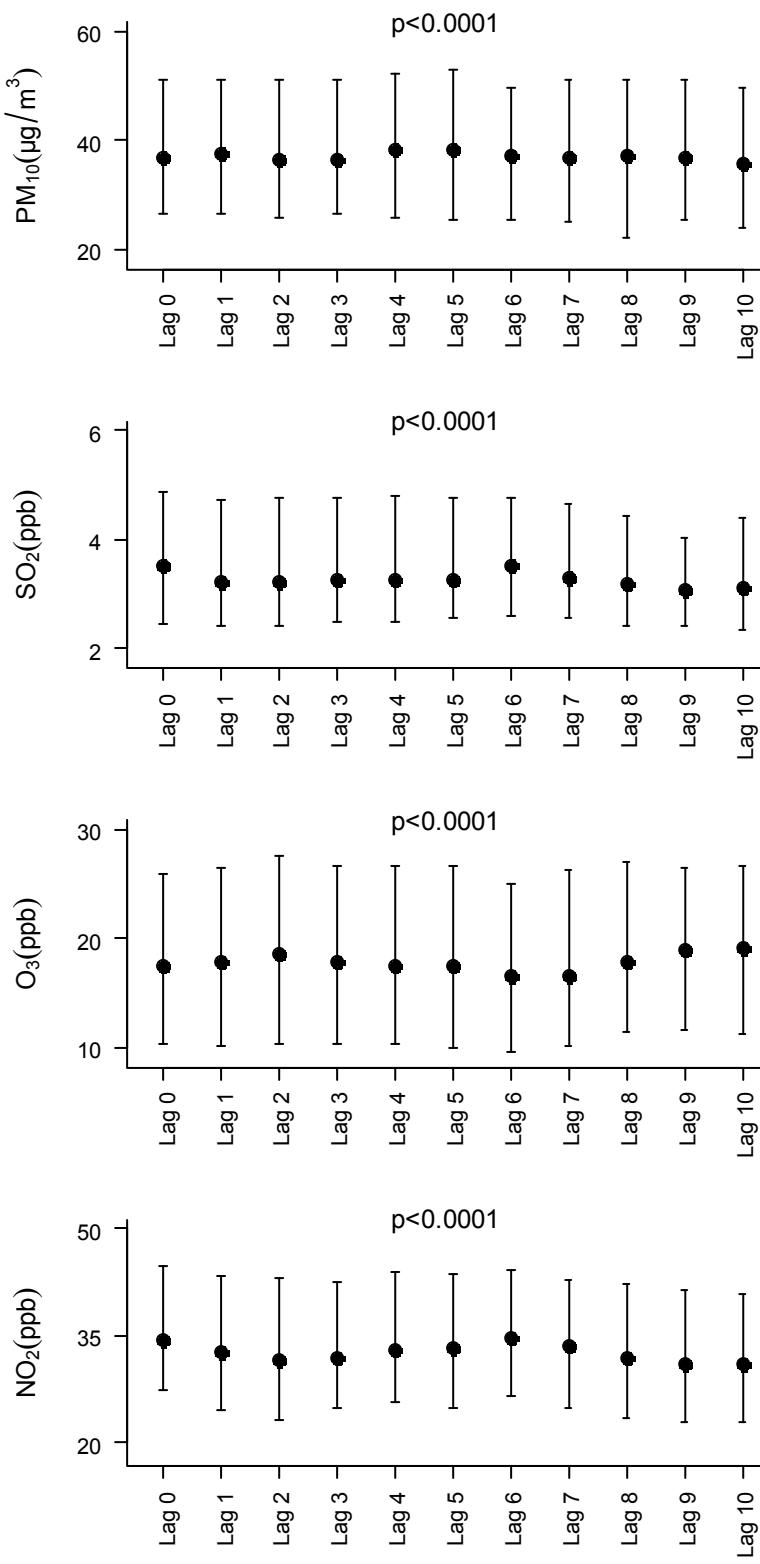
Lag day	Glucose			Insulin			HOMA			
	Estimate	95% CI	p-Value	Estimate	95% CI	p-Value	Estimate	95% CI	p-Value	
NO ₂	Lag 0	0.03	-0.03, 0.09	0.3734	0.49	0.04, 0.94	0.0342	0.15	0.0002, 0.31	0.0503
	Lag 1	0.01	-0.05, 0.08	0.7364	0.33	-0.14, 0.79	0.1675	0.13	-0.03, 0.29	0.1005
	Lag 2	0.05	-0.02, 0.12	0.1329	0.47	0.005, 0.94	0.0483	0.20	0.04, 0.36	0.0126
	Lag 3	0.07	0.01, 0.13	0.0310	0.23	-0.21, 0.66	0.3090	0.13	-0.02, 0.28	0.0937
	Lag 4	0.08	0.02, 0.14	0.0078	0.07	-0.34, 0.47	0.7554	0.09	-0.05, 0.23	0.2154
	Lag 5	0.04	-0.02, 0.10	0.1765	0.001	-0.41, 0.41	0.9977	0.03	-0.11, 0.17	0.6619
	Lag 6	0.05	-0.01, 0.11	0.1121	0.41	-0.02, 0.84	0.0628	0.15	0.004, 0.30	0.0452
	Lag 7	0.11	0.05, 0.17	0.0004	0.71	0.29, 1.14	0.0010	0.28	0.13, 0.42	0.0002
	Lag 8	0.08	0.02, 0.14	0.0124	0.35	-0.10, 0.79	0.1307	0.16	0.01, 0.32	0.0354
	Lag 9	0.03	-0.03, 0.10	0.3184	0.34	-0.13, 0.81	0.1543	0.08	-0.08, 0.25	0.3039
	Lag 10	-0.02	-0.08, 0.04	0.5795	0.26	-0.18, 0.70	0.2508	0.03	-0.12, 0.18	0.6573

Changes in glucose, insulin, and HOMA indices by an IQR-change of PM₁₀ (20.8 µg/m³), SO₂ (1.6 ppb), O₃ (15.1 ppb), and NO₂ (10.8 ppb) were estimated in linear mixed-effect models after weighting follow-up observations and adjusting for age, sex, BMI, cotinine level, and outdoor temperature and dew point in the day. CI, Confidence Interval.

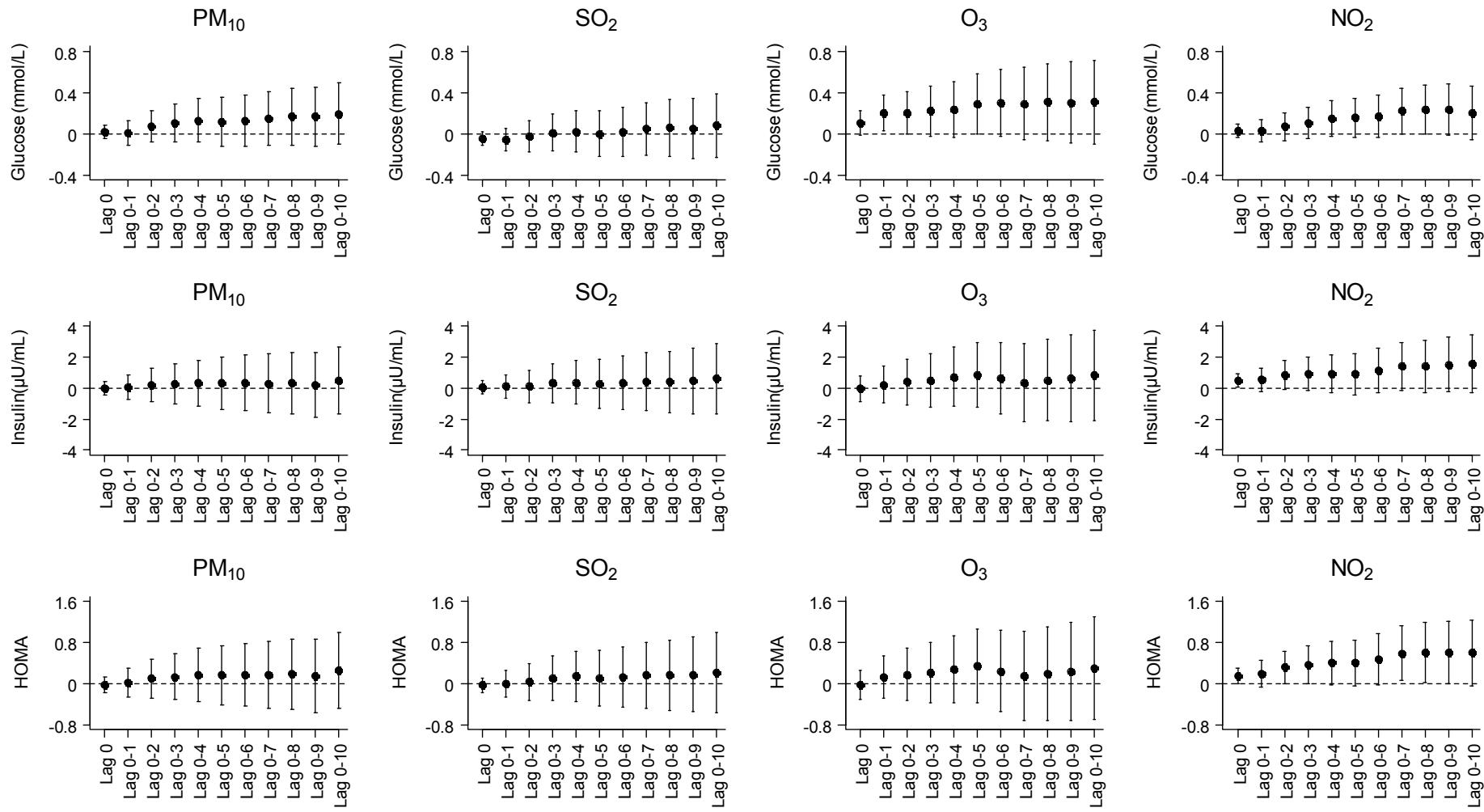
Supplemental Material, Table S3. Associations of PM₁₀, O₃, and NO₂ with glucose, insulin, and HOMA indices in multiple pollutant models.

	Glucose			Insulin			HOMA		
	Estimate	95% CI	p-Value	Estimate	95% CI	p-Value	Estimate	95% CI	p-Value
Two pollutant model									
PM ₁₀	0.08	0.01, 0.14	0.0178	0.07	-0.38, 0.52	0.7579	0.09	-0.06, 0.25	0.2345
O ₃	0.15	0.05, 0.25	0.0036	0.67	-0.06, 1.39	0.0711	0.25	-0.001, 0.49	0.0518
PM ₁₀	0.08	0.02, 0.15	0.0074	0.03	-0.41, 0.47	0.8955	0.08	-0.07, 0.23	0.2989
NO ₂	0.08	0.02, 0.15	0.0068	0.71	0.27, 1.14	0.0016	0.26	0.11, 0.41	0.0007
O ₃	0.16	0.06, 0.25	0.0011	0.49	-0.20, 1.19	0.1649	0.21	-0.02, 0.45	0.0787
NO ₂	0.09	0.03, 0.15	0.0049	0.65	0.22, 1.08	0.0031	0.25	0.10, 0.40	0.0009
Three pollutant model									
PM ₁₀	0.06	-0.005, 0.12	0.0695	-0.07	-0.53, 0.39	0.7758	0.04	-0.11, 0.20	0.5799
O ₃	0.13	0.03, 0.23	0.0094	0.52	-0.20, 1.25	0.1582	0.19	-0.06, 0.44	0.1280
NO ₂	0.07	0.01, 0.14	0.0179	0.67	0.23, 1.11	0.0032	0.24	0.09, 0.39	0.0016

p-Values obtained after weighting follow-up observations of PM₁₀, O₃, and NO₂ on lag day 4, lag day 5, and lag day 7, respectively. Changes in glucose, insulin, and HOMA indices by an IQR-change of PM₁₀ (20.8 µg/m³), O₃ (15.1 ppb), and NO₂ (10.8 ppb) were estimated after adjustment for age, sex, BMI, cotinine level, and outdoor temperature and dew point in the day. CI, Confidence Interval.



Supplemental Material, Figure e S1. Variation of air pollutant levels over 11 days including the health examination day. Median values of each pollutants and ranges between 25th and 75th percentiles were presented.



Supplemental Material, Figure S2. Associations of PM₁₀, SO₂, O₃, and NO₂ with glucose, insulin, and HOMA indices by distributed lag days in total subjects. Changes in glucose, insulin, and HOMA indices by an IQR-change of PM₁₀ (20.8 $\mu\text{g}/\text{m}^3$), SO₂ (1.6 ppb), O₃ (15.1 ppb), and NO₂ (10.8 ppb) were estimated after adjustment for age, sex, BMI, cotinine level, and outdoor temperature and dew point in the day.